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acteristic of the world in which animal bodies had come to be. That is, mind in the transcendental sense can have no genesis. The term when so used does not indicate an individual existence whose days may be numbered. Like mechanism, chemistry, and what in general we call the laws of nature, it indicates a type of structure or a system of connections, a logical structure it might be called or a system of logical connections. To this structure living beings conform in much the same way as they conform to other structural facts. As by conforming to the mechanical structure of things they maintain their equilibrium, so by conforming to the logical structure of things they think in propositions, they make distinctions and so finally come to discover themselves as distinct from their world, recognize themselves as the habitations of mind, and undertake the study of psychology.

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THE UNITY OF CONSCIOUSNESS

FROM the rise of modern philosophy to the present day, great interest has centered around the problem of the unity of consciousness. That consciousness *has* a certain unity, or appearance of unity, no one questions; the problem lies in giving an explanation of that unity which will contradict neither the findings of descriptive psychology nor the requirements of sound logic nor the facts brought to light by experimental investigation.

Several of the chapters of James's *Psychology*¹ seem to many writers to have dealt in an exhaustive way with the descriptive and logical sides of the discussion. There we find a trenchant criticism of the mind-stuff theory, so compelling to many minds as to banish for them into outer darkness any theory of psychic atomism. "As a feeling feels, so it is," if recognized as an axiom, argues mightily against unconscious mental states or the fusion of conscious elements in a present feeling. Two assumptions made by James, however, have somewhat undermined his clearly spun theory. One of these is the assumption that a present feeling is aware of itself; the other, that a present feeling is in some unexplained way "appropriative" of the content of the immediately preceding one. The credit for exposing these weaknesses is due to Professor Strong.² On the one hand, he has shown that consciousness is not interfused with the content of the psychic state, so that to have a feeling is to be conscious of it, but that consciousness is something

¹ Cf. Chaps. VI, IX, X, XIII.

² Charles A. Strong, *The Origin of Consciousness*, London, 1918.

adventitious supervening upon the psychic state. On the other hand, he has described *how* a present feeling appropriates a past feeling by the continued presence of the latter as the object of cognition, the process involving the simultaneous existence of two psychic states.

The refutation of the phenomenalist position regarding consciousness has far-reaching consequences. It has led to the repudiation of that mysterious unity of the momentary conscious state which was supposed to be an ultimate characteristic. Dr. Strong has shown that there is no such unity, and thus the possibility of some kind of a temporary fusion of psychic states is again presented. James's logical demand, that sensations in order to fuse must have a medium of combination, is not refuted. The question, rather, is raised as to what is the nature of the medium. Bergson's theory of feelings as due to memorial summation, adopted by Strong,³ leaves this question open. Sherrington⁴ has adduced experimental evidence to prove that at the time of binocular perception uniocular visual images are developed to a point where their concomitant sensations are capable of being introspected under suitable conditions of experimentation. This would indicate that the integration was not an integration of sensory areas of the cerebrum. Further consideration of the manner of fusion seems inevitable, as we may not be satisfied by crude statements of fusion like those contained in the writing of Münsterberg.⁵

One preliminary revision of James's theory of consciousness that may be suggested at the outset is the rejection of the notion, expressed in the *Psychology*, that the child's first consciousness is "one great blooming, buzzing confusion."⁶ Now I have a perception of confused objects, not when I am entirely unfamiliar with them, but when I discriminate one from another only partially. The confusion is due to my inability to synthesize on a sudden various impressions which immediately suggest to me partial meanings. Thus, when I enter a room and am confronted with a blaze of color and a babel of sound, my perception of confusion is my

³ *Ibid.*, pp. 199-200.

⁴ Charles H. Sherrington, *The Integrative Action of the Nervous System*, New Haven, 1906, pp. 382-383. His important conclusion may well be quoted. (Italics not mine.) "Our experiments show, therefore, that during binocular regard of an objective image each uniocular mechanism develops independently a sensual image of considerable completeness. The singleness of the binocular perception results from union of these elaborated uniocular sensations. The singleness is therefore the product of a synthesis that works with already elaborated sensations contemporaneously proceeding."

⁵ Hugo Münsterberg, *Psychology, General and Applied*, New York and London, 1916, pp. 133-134.

⁶ *Op. cit.*, I, p. 488.

imperfect discrimination of colors and sounds which themselves are familiar to me. One recalls the instance of two Esquimaux who were brought from Arctic regions and led along Broadway, New York City. It is said that they were quite undisturbed by the bustle of traffic and the sight of unaccustomed buildings, and became attentive only when they caught sight of a furrier's window hung with skins. The "blooming, buzzing confusion," moreover, does not harmonize well with James's theory of the unity of the momentary conscious state. If the unity apparent in the conscious state is one of its most fundamental characteristics, we should hardly expect to find it born in confusion.

The motor aspect of the attention-process also would seem to bar the presence of conscious confusion where the objects cognized have not previously been reacted to. Of late, in the writings of authors so diverse in their general outlook as Strong, Bergson, Münsterberg, and the behaviorists, there is a strong tendency to emphasize the part played by the motor half of the reflex arc in giving an account of cognition. Presently I shall discuss the relative importance of stimulation and reaction for cognition. Here I may say that if the motor factor is an integral feature of cognition, the new-born baby could not feel a confusion of sensations because it would be able to feel only those to which it had previously reacted. The only alternative to this conclusion is the almost unthinkable supposition that at the birth of consciousness a multitude of sensory stimulations, normally giving rise to reflex actions, are inhibited at the center of the arc and shot up through the spinal cord to the cortex.

Lack of familiarity with objects capable of stimulating the sense end-organs and the absence of many potential reactions would seem to make the new-born consciousness a much simpler affair than James supposed. Coming closer to the problem of unity, we may ask as to the nature of the complex perception. Here the relation between consciousness and the object on the motor side is exceedingly important. As Dr. Strong says,⁷ to an instantaneous sensation we could not react. The unity of a sensation, therefore, must be accounted for on the basis of memorial summation, primary memory furnishing an object to which attention may be directed. Dr. Strong observes the close similarity between introspection and sense-perception. He says,⁸ "The motor attitude in introspection is therefore of the same general kind as that in sense-perception, and differs from it only in being to an object inside the body and not to one outside it." Dr. Strong argues power-

⁷ *Op. cit.*, p. 201.

⁸ *Ibid.*, pp. 201-202.

fully for the chief place of attention in giving unity to the field of consciousness.⁹ He concludes that the momentary psychic state has no *existential* unity; its apparent unity is due to a convenience of treatment, attention being the main factor.

With the results of Dr. Strong's study I am completely in accord. I would wish, however, to carry a little further the analysis of what constitutes the *apparent* unity of consciousness. I would wish also to show in some detail how James's arguments against the mind stuff theory are not valid if applied against introspective realism, and how, under the latter theory, a certain kind of fusion, or, better, an appearance of sensations *as if* fused, is not invalidated by James's arguments.

I

The latter points may be discussed first. James leaves us two alternatives. Either there must be a fusion of sensations, in which case a soul must be postulated as the medium of fusion, or there must be a fusion of brain-states to which a single psychic state corresponds *in toto*. Now, obviously, if Dr. Strong has shown that the unity of consciousness is only a specious unity, we shall not need to controvert James's logical objection to the mind-stuff theory. The existences known as sensations and images have no *vinculum*. But although James was skeptical in regard to a possible fusion of psychic states, he was believing when it came to the unity of the single perception. He found just reason logically to object to the statement that sensation *a* plus sensation *b* would yield a sensation (*a + b*). He made no difficulty, however, in recognizing that sensation (*a + b*) had unity. It is the merit of Dr. Strong's work to have shown us that sensation (*a + b*) has no existential unity, but is the result of a certain convenience of treatment of psychic states controlled by the limitations of the attention-process. The way is open, therefore, not to reestablishing the doctrine of a fusion of separate sensations in the old sense, but to a new conception of fusion based on certain features of the mechanism of attention. Under this new conception of fusion, the fusion will not be conceived as of sensations in their own right, but it will appear as a fusion in our attitude toward psychic states that are in themselves quite unalterably distinct. In shovelling coal into a furnace the separate coals in the shovel are not fused into one larger coal, but it is convenient for me to treat the coals *en masse* as one shovelful while I am performing the operation of shovelling. So in some way the separate tones of a chord do not come to

⁹ *Ibid.*, pp. 280-282.

consciousness as separate sensations there to fuse into one impression; rather does the mechanism of my psyche make it convenient for me to treat the stimulations of numerous fibers of the basilar membrane as one sound—the cerebral disturbances likely covering a goodly extent of brain-area.

The first protest against this new way of conceiving fusion will be doubtless a denial of its newness. On the one hand it will be claimed that here there is no fusion of sensations, that the single perception resulting from the excitation of the neural mechanism is as single as James would have desired. On the other hand it will be claimed that the fusion, if such it is to be called, takes place in the brain, that the mechanism of attention is substituted merely for the exploded concept of an arch-cell. Both of these objections are true as facts, but they are not objections to the theory. They do not invalidate the usefulness of my statement. The utility of my point of view appears when it is observed on the negative side (1) that many psychic states may be present in an “unfused” form, and (2) that the integration of brain-states is a process not entirely correlated with psychic activity, but occurs only as a momentary expedient.

1. Many psychic states may be present in an “unfused” form. If we use the term “sensation” always to mean one of the elements of a conscious state, we shall never speak of sensations as present but unperceived. Careless terminology has resulted in the use of an expression “unconscious sensation”—a self-contradiction taken advantage of by James in his criticism of the mind-stuff theory.¹⁰ We are on safer ground when we refuse to define “sensation” as a *conscious* element of experience, or when, better, we substitute the term “psychic state” and reserve “sensation” for the meaning “given psychic state.” In the latter case we recognize that consciousness is adventitious to the psychic state, and that the existence of a psychic state is not due to its conscious quality when attended to. Attention will be the main factor in bringing an unconscious psychic state to consciousness.

It is the contention of this paper that attention thus modifies psychic states.¹¹ First the process may be observed in the case of single sensations. We may not attend to an instantaneous sensation. Attention to the single sensation is contingent on the presence of a series of instantaneous states, each after the first cognizing its predecessors. A conscious moment, therefore, demands the presence of at least *two* psychic states, of neither of which are we separately conscious. Modification of psychic states by atten-

¹⁰ *Op. cit.*, I, pp. 172–175.

¹¹ *Cf. Strong, op. cit.*, p. 137.

tion again appears in the case of perception, where numerous sense-stimuli are involved. If *a* and *b* stand for parts of a chair, and if I perceive the whole chair, not discriminating the parts, my perception of (*a* + *b*) is very different from my perceptions of *a* and *b* separately. Instead, however, of supposing that a soul unifies sensations of *a* and *b*, or that the unity is accomplished by an integration of brain-states on the sensory side, we shall more rightly ascribe the "togetherness" of the psychic states to the motor factors of attention, and deny that the psychic states or their neural concomitants, *as such*, are fused at all. We shall, of course, also deny that there is any real unity given to perception by the addition to psychic states of the conscious quality. We shall rather aver that as a feeling feels, so it is *not*, agreeing with Dr. Strong that the *esse* of a feeling is *sentire*, not *sentiri*.

At the risk of repetition, I may restate the previous argument in other words. In cognition, although an instantaneous sensation might be aware of an essence, there could be no meaning attached to the essence if primary memory did not preserve the essences given in preceding instants. We have no perception of an object that is flashed before our eyes too quickly for a trace of its successive stages to be recorded in primary memory. It is also a commonplace that in perception memory-images are an essential feature. The fact that some kind of memory is concerned in all sensation and perception to which meaning is attached—in other words, in all attentive consciousness—leads us to inquire what binds together the elements of sensation and perception. We answer that it is attention. Attention gives the sensation or perception a certain necessary duration. We are then confronted with the question: are we to conceive of the sensation or perception as a single psychic state (no matter how complex it may seem) conscious of itself, or are we to consider the perception to be composed of simpler elements, psychic states, of which we are sometimes aware, and which are sometimes aware of other psychic states, but which are never aware of themselves?¹² As a mere supposition, the latter solution seems more probable. The only difficulty to be overcome is that of finding the explanation for the fact that *many* psychic states must then be conceived as appearing as *one*. Once we have solved this difficulty, however, we may conclude that the conscious quality is something adventitious to their existence, and that therefore we have no warrant in saying that only those psychic states exist of which we are conscious. In the conscious moment, certain psychic states have a specious unity, while actually remaining as unfused and distinct as you please.

¹² Cf. Strong, *op. cit.*, p. 207.

But let us not be extravagant by hypothetically multiplying the number of unconscious psychic states. No warrant for an atomistic conception of psychic existence may be adduced from this inquiry. The problem of the degree and nature of neural activity necessary to the production of a psychic state (*i.e.*, the extent to which neural integration is necessary) must be left for experimental psychology to determine. Sherrington has made a beginning, by showing that the unioocular visual images are psychically distinct.

2. The integration of brain-states is a process not entirely correlated with psychic activity, but occurs only as a momentary expedient. Although it is certain from experimental evidence that many areas of the brain are involved in a single perception, it by no means follows that all of the neural activities of the brain at any one moment are correlated with the conscious state. We may naturally suppose correlation to subsist between the clearest psychical elements (those at the focus of attention) and the most predominant neural activities. If this is true, the neural concomitants of marginal consciousness will be less predominant. Now if complete integration occurs, we must suppose that the neural concomitants of all psychic elements other than those at the focus of attention are correlated with marginal consciousness. It is much more plausible that marginal consciousness is a mean between conscious and unconscious psychic states—a theory rendered probable if awareness is adventitious to psychic states. As Dr. Strong says,¹⁸ the existence of unconscious mental states is a question of fact, not of principle. Attention, therefore, would seem to play like a searchlight over a wide range of mental states, now lighting a spot barely seen at the previous moment, now bringing into conscious view spots just previously shrouded in darkness.

II

If the foregoing analysis is grounded in fact, we are driven to seek an answer to a question that irresistibly presents itself. Is there some principle by which the specious fusion of psychic states under the conditions of the mechanism of attention takes place? The term “specious fusion” has been used to indicate a process the nature of which yet has to be described. On the one hand, we have the phenomenal unity of the present moment, so much emphasized by James. On the other hand, we have the coexistence of an undetermined number of psychic states. In some manner attention is responsible for the apparent unity of the perception. But how is the process to be conceived?

¹⁸ *Ibid.*, p. 207.

If awareness is a function of psychic states due to an integration of motor concomitants, it is evident that the presence and character of consciousness will be determined by the presence and limitations of the attention-process. Every perception involves a "set" of the organism to some reaction. The selection and single treatment of psychic states arising from a variety of stimuli are due to the fact that we can not do or intend two actions at the same time. The details of the process may be subsumed under the principles of contiguity and identity.¹⁴

1. In a transverse view a perception may be analyzed into a variety of sensations and images. Our view of the coexistence of psychic states, however, need not lead us to affirm the Lockian principles of the compounding of sensations, so attacked by James. The "ideas" are not to be conceived as fusing among themselves in some incomprehensible way, but as being capable of treatment as a whole so far as attention is concerned. Later, by turning the attention to the several elements of a perception, thus obtaining a series of *new* perceptions, the parts may be envisaged, but this is a matter of discrimination rather than dismemberment. When I grasp a tumbler with both hands, the tactual perception does not result from the fusion of psychic states due to the tactual sensations derived from each hand, but from a unified reaction due to the whole action of grasping an object.

2. The unification of many elements in the perception leads to consideration of the specious fusion of the psychic elements involved in the perception of a single element. Out of this consideration the general principle of specious fusion will emerge. How are we to explain the single treatment, in consciousness, of the succession of psychic states that occurs in the memorial summation in a feeling? In this way: *attention treats as one psychic elements that are identical or nearly identical*. Here we have an explanation of the phenomenal unity of the single sensation. We could not *react* to a psychic state that is momentary. There is a certain slowness of movement of our bodies in relation to their environment. We are not able to respond to stimulations by single molecules, whether they be arranged in space simultaneously or in time serially. Indeed, we are also unable to be stimulated by such minute structures. The sensory side of the reflex arc thus also has bearing on the problem of attention. But the significant fact, the fact that results in the apparent unity of consciousness in contradistinction to the plurality of psychic states, is that *our reactions are slower than the working of our sensory mechanism*. The slowness of reaction *compels* a certain unification of psychic states.

¹⁴ Cf. George Santayana, *The Life of Reason*, I, pp. 165-170.

The non-discrimination of identical or nearly identical psychic states accounts for our perception of objects as static bodies. It makes it possible for us to live in a stable world rather than in a Heraclitan flux. It also accounts for the facts adduced by Sherrington in reference to binocular perception. Where the uniocular visual images are *nearly* identical, they are perceived as one (for we may react to them as to one object), although under suitable conditions of experimentation they may be revealed as composed of simpler psychic states.

III

We may now give a concise statement of our theory: The conscious quality is attached to certain psychic states concerned in the process of attention. Reflex without conscious activity may become complicated up to a limited extent until the conditions of reaction do not keep pace with the mechanism of sensory stimulation. The unequal balancing of the forces of stimulation and reaction calls for a selection from among psychic states of some few which may be correlated with a unified reaction. The activity of these cells (selected in accordance with the familiar laws of the determination of attention) is heightened, the difference being manifest by the addition of the conscious quality. Consciousness is thus seen, from the standpoint of its origin, to be in the first instance a psychic concomitant of selected neural activities, and the whole process of selection appears as a device to supplement reflex action where a complete integration is impossible owing to the complexity of the sensory mechanism. In accord with the theory is the fact that actions at first performed only consciously may become later reflex actions. Here consciousness (or rather the whole process of attention with which consciousness is associated as one element) has served the purpose of integration, and the action may be repeated under suitable conditions of stimulation without conscious intervention.

Perhaps it may be superfluous to remark that the conscious quality of psychic states is amenable to the same law of specious fusion that was described in reference to other qualities. Its application is somewhat different, however. Whereas one psychic state in memorial summation is able to cognize the content of preceding psychic states, the conscious quality of a psychic state, being an adventitious characteristic and no part of the psychic state as such, but rather a difference of function, is unable to cognize the conscious quality of another psychic state. Thus, although we make the distinction between conscious and unconscious psychic states, we may never directly compare the two or directly cog-

nize consciousness. When, however, attention holds in its focus several psychic states, the identity of activity in each serves the negative purpose of keeping away any sense of discreteness. That is, because the conscious quality is the same to whatever psychic state it may be attached, it does not interfere with the specious fusion of contents.

Many important considerations in the light of the theory which we have presented, such as its bearing on the problem of truth and error, and on the compatibility of an instrumental view of the origin of cognition with a realistic outlook, would have to be the subjects of special study. I may point out, however, that the theory well fits into the framework of the theory of psycho-physical monism (introspective realism). If psychic states are the "things-in-themselves" or the "inner substance" of their neural concomitants, the disparity in the correlation of motor factors of attention and the conscious quality of psychic states ceases to be a problem.

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Note.—For the sake of clearness, I have left to an appended note the discussion of a point which, although important, is not vital to the argument. In Bergson's conception of memorial summation, matter and consciousness are conceived each to possess its own peculiar rhythm. The rhythm of consciousness, slower than the rhythm of matter, allows the former to sum up vast periods of matter's rhythm. This thesis leads to the assumption that perception and matter differ chiefly in their respective tensions. I do not subscribe to this doctrine, nor is it essential in any way to my argument. Dr. Strong, in accepting it, seems to interpret it differently from its proponent's interpretation. For he assumes the reality of homogeneous time, which Bergson denies. Dr. Strong says, "We must remember, secondly, that the time during which a brief feeling exists is spun out infinitely fine—that it does not come all at once, at a single clap of the hand, as it were, but comes in an infinite succession of instants. To each of these instants of feeling the proposition applies that without memory—primary memory, that is, memory of a fact immediately after its occurrence—it would, on its cessation, completely de cease. The apparent block which a feeling offers to introspection is thus due to the summation of an infinity of instantaneous parts by primary memory." The "infinite succession of instants" to which Dr. Strong refers, and during which he says a feeling exists, is obviously thought by him to be one with the succession of instants during which concomitant happenings in the physical world take place—i.e., homogeneous time. "The apparent block which a feeling offers to introspection" is thus conceived as due to a summation of the infinite parts of each appreciable moment of a feeling by primary memory. I find this statement hardly within the bounds of possibility. Logically, no doubt, we can so divide a momentary feeling, but psychologically it is most doubtful whether such a process is implicit. As James says, there is no necessary numerical correlation between cause and effect. In fact, experimental psychology seems to have

demonstrated conclusively that integration of neural vibrations is often necessary to the production of any feeling at all. Howbeit, there is a certain necessary duration in the case of every appreciable sensation. We need not try to go back of that. Given this momentary feeling, primary memory will be requisite if the next appreciable instant is to recognize its predecessor. The summation, under the theory, will therefore occur in the sensation's own rhythm. (Cf. Strong, *op. cit.*, p. 200; Bergson, *Matter and Memory*, pp. 267-282.)

REVIEWS AND ABSTRACTS OF LITERATURE

A Critical History of Greek Philosophy. W. T. STACE. Glasgow: University Press. London: Macmillan and Co. 1920. Pp. xiv + 386.

Clarity is often a virtue of intolerance. A man with convictions knows precisely what he believes and is able to measure the worth of ideas as any want of conformity unto or transgression of *his* standards of belief. Mr. Stace is a man with convictions. He knows exactly what he means by philosophy and writes a "critical" history of Greek thought in the light (or darkness) of this meaning. The style and manner of presentation are extraordinarily simple and clear. There are more monosyllables to the paragraph than in any philosophical treatise with which I am familiar. Lucidity is the chief merit of the book. As a contribution to historical scholarship it is altogether unimportant. The author takes the stock facts and traditional material found in any ordinary text-book and presents them in a manner remarkable for its simplicity, clarity and easy intelligibility.

But should a man with "convictions" write a history of philosophy at all? *A priori* this is doubtful. *A posteriori* one with Mr. Stace's convictions should decidedly *not* write the history of anything. Philosophy, he says, is an attempt "to rise from sensuous to non-sensuous thought." It is "the gradual and steady rise to the supreme heights of idealism."¹ The history of philosophy "presents a definite line of evolution." It is the "onward march of thought to a determined goal." "The truth gradually unfolds itself in time." These conceptions are not generalizations derived from an examination of the subject-matter of Greek thought, they are initial definitions in terms of which the history of Greek thought is to be described and interpreted. That the *true* philosophy is idealism and that philosophy is an evolution from sensuous to non-sensuous thinking are the beliefs in terms of which the criticism proceeds.

¹ *A Critical History of Greek Philosophy*, XII.